



# SEQUENCE LISTING

<110> HATTORI, NORIAKI  
MURAKAMI, SEIJI

<120> LUCIFERASE AND A METHOD FOR DETECTING INTRACELLULAR ATP USING THE  
SAME

<130> 193582US-3524-7126-0 PCT

<140> 09/581241

<141> 2000-06-26

<150> JP97/361022

<151> 1997-12-26

<160> 8

<170> PatentIn version 3.2

<210> 1

<211> 23

<212> DNA

<213> ARTIFICIAL SEQUENCE

<220>

<223> SYNTHETIC DNA

<400> 1

tgttgtactt aagaaaggaa aat

23

<210> 2

<211> 23

<212> DNA

<213> ARTIFICIAL SEQUENCE

<220>

<223> SYNTHETIC DNA

<400> 2

acagctcccg gaagctcacc agc

23

<210> 3

<211> 1644

<212> DNA

<213> Luciola lateralis

<220>

<221> CDS

<222> (1) .. (1644)



ggt Gly 210	gtg Val	caa Gln	ctt Leu	act Thr	cat His	gaa Glu 215	aat Asn	ttg Leu	gtc Val	act Thr	aga Arg 220	ttt Phe	tct Ser	cac His	gct Ala	672
aga Arg 225	gat Asp	cca Pro	att Ile	tat Tyr	gga Gly 230	aac Asn	caa Gln	gtt Val	tca Ser	cca Pro 235	ggc Gly	acg Thr	gct Ala	att Ile	tta Leu 240	720
act Thr	gta Val	gta Val	cca Pro	ttc Phe 245	cat His	cat His	ggg Gly	ttt Phe	ggg Gly 250	atg Met	ttt Phe	act Thr	act Thr	tta Leu 255	ggc Gly	768
tat Tyr	cta Leu	act Thr	tgt Cys 260	ggg Gly	ttt Phe	cgt Arg	att Ile	gtc Val 265	atg Met	tta Leu	acg Thr	aaa Lys	ttt Phe 270	gac Asp	gaa Glu	816
gag Glu	act Thr	ttt Phe 275	tta Leu	aaa Lys	aca Thr	ctg Leu	caa Gln 280	gat Asp	tac Tyr	aaa Lys	tgt Cys	tca Ser 285	agc Ser	ggt Val	att Ile	864
ctt Leu 290	gta Val	ccg Pro	act Thr	ttg Leu	ttt Phe	gca Ala 295	att Ile	ctt Leu	aat Asn	aga Arg	agt Ser 300	gaa Glu	tta Leu	ctc Leu	gat Asp	912
aaa Lys 305	tat Tyr	gat Asp	tta Leu	tca Ser	aat Asn 310	tta Leu	gtt Val	gaa Glu	att Ile	gca Ala 315	tct Ser	ggc Gly	gga Gly	gca Ala	cct Pro 320	960
tta Leu	tct Ser	aaa Lys	gaa Glu	att Ile 325	ggg Gly	gaa Glu	gct Ala	gtt Val	gct Ala 330	aga Arg	cgt Arg	ttt Phe	aat Asn	tta Leu 335	ccg Pro	1008
ggg Gly	gtt Val	cgt Arg	caa Gln 340	ggc Gly	tat Tyr	ggg Gly	tta Leu	aca Thr 345	gaa Glu	aca Thr	acc Thr	tct Ser	gca Ala 350	att Ile	att Ile	1056
atc Ile	aca Thr	ccg Pro 355	gaa Glu	ggc Gly	gat Asp	gat Asp	aaa Lys 360	cca Pro	ggg Gly	gct Ala	tct Ser	ggc Gly 365	aaa Lys	gtt Val	gtg Val	1104
cca Pro 370	tta Leu	ttt Phe	aaa Lys	gca Ala	aaa Lys	gtt Val 375	atc Ile	gat Asp	ctt Leu	gat Asp	act Thr 380	aaa Lys	aaa Lys	act Thr	ttg Leu	1152
ggc Gly 385	ccg Pro	aac Asn	aga Arg	cgt Arg	gga Gly 390	gaa Glu	gtt Val	tgt Cys	gta Val	aag Lys 395	ggg Gly	cct Pro	atg Met	ctt Leu	atg Met 400	1200
aaa Lys	ggg Gly	tat Tyr	gta Val	gat Asp 405	aat Asn	cca Pro	gaa Glu	gca Ala	aca Thr 410	aga Arg	gaa Glu	atc Ile	ata Ile	gat Asp 415	gaa Glu	1248

gaa ggt tgg ttg cac aca gga gat att ggg tat tac gat gaa gaa aaa	1296
Glu Gly Trp Leu His Thr Gly Asp Ile Gly Tyr Tyr Asp Glu Glu Lys	
420 425 430	
cat ttc ttt atc gtg gat cgt ttg aag tct tta atc aaa tac aaa gga	1344
His Phe Phe Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly	
435 440 445	
tat caa gta cca cct gct gaa tta gaa tct gtt ctt ttg caa cat cca	1392
Tyr Gln Val Pro Pro Ala Glu Leu Glu Ser Val Leu Leu Gln His Pro	
450 455 460	
aat att ttt gat gcc ggc gtt gct ggc gtt cca gat cct ata gct ggt	1440
Asn Ile Phe Asp Ala Gly Val Ala Gly Val Pro Asp Pro Ile Ala Gly	
465 470 475 480	
gag ctt ccg gga gct gtt gtt gta ctt aag aaa gga aaa tct atg act	1488
Glu Leu Pro Gly Ala Val Val Val Leu Lys Lys Gly Lys Ser Met Thr	
485 490 495	
gaa aaa gaa gta atg gat tac gtt gct agt caa gtt tca aat gca aaa	1536
Glu Lys Glu Val Met Asp Tyr Val Ala Ser Gln Val Ser Asn Ala Lys	
500 505 510	
cgt ttg cgt ggt ggt gtc cgt ttt gtg gac gaa gta cct aaa ggt ctc	1584
Arg Leu Arg Gly Gly Val Arg Phe Val Val Asp Glu Val Pro Lys Gly Leu	
515 520 525	
act ggt aaa att gac ggt aaa gca att aga gaa ata ctg aag aaa cca	1632
Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro	
530 535 540	
ggt gct aag atg	1644
Val Ala Lys Met	
545	

<210> 4  
 <211> 548  
 <212> PRT  
 <213> *Luciola lateralis*

<400> 4

Met Glu Asn Met Glu Asn Asp Glu Asn Ile Val Tyr Gly Pro Glu Pro
1 5 10 15
Phe Tyr Pro Ile Glu Glu Gly Ser Ala Gly Ala Gln Leu Arg Lys Tyr
20 25 30

Met	Asp	Arg	Tyr	Ala	Lys	Leu	Gly	Ala	Ile	Ala	Phe	Thr	Asn	Ala	Leu	35	40	45
Thr	Gly	Val	Asp	Tyr	Thr	Tyr	Ala	Glu	Tyr	Leu	Glu	Lys	Ser	Cys	Cys	50	55	60
Leu	Gly	Glu	Ala	Leu	Lys	Asn	Tyr	Gly	Leu	Val	Val	Asp	Gly	Arg	Ile	65	70	75
Ala	Leu	Cys	Ser	Glu	Asn	Cys	Glu	Glu	Phe	Phe	Ile	Pro	Val	Leu	Ala	85	90	95
Gly	Leu	Phe	Ile	Gly	Val	Gly	Val	Ala	Pro	Thr	Asn	Glu	Ile	Tyr	Thr	100	105	110
Leu	Arg	Glu	Leu	Val	His	Ser	Leu	Gly	Ile	Ser	Lys	Pro	Thr	Ile	Val	115	120	125
Phe	Ser	Ser	Lys	Lys	Gly	Leu	Asp	Lys	Val	Ile	Thr	Val	Gln	Lys	Thr	130	135	140
Val	Thr	Ala	Ile	Lys	Thr	Ile	Val	Ile	Leu	Asp	Ser	Lys	Val	Asp	Tyr	145	150	155
Arg	Gly	Tyr	Gln	Ser	Met	Asp	Asn	Phe	Ile	Lys	Lys	Asn	Thr	Pro	Gln	165	170	175
Gly	Phe	Lys	Gly	Ser	Ser	Phe	Lys	Thr	Val	Glu	Val	Asn	Arg	Lys	Glu	180	185	190
Gln	Val	Ala	Leu	Ile	Met	Asn	Ser	Ser	Gly	Ser	Thr	Gly	Leu	Pro	Lys	195	200	205
Gly	Val	Gln	Leu	Thr	His	Glu	Asn	Leu	Val	Thr	Arg	Phe	Ser	His	Ala	210	215	220
Arg	Asp	Pro	Ile	Tyr	Gly	Asn	Gln	Val	Ser	Pro	Gly	Thr	Ala	Ile	Leu	225	230	235
																240		

Thr	Val	Val	Pro	Phe 245	His	His	Gly	Phe	Gly 250	Met	Phe	Thr	Thr	Leu 255	Gly	
Tyr	Leu	Thr	Cys 260	Gly	Phe	Arg	Ile	Val 265	Met	Leu	Thr	Lys	Phe 270	Asp	Glu	
Glu	Thr	Phe 275	Leu	Lys	Thr	Leu	Gln 280	Asp	Tyr	Lys	Cys	Ser 285	Ser	Val	Ile	
Leu	Val 290	Pro	Thr	Leu	Phe	Ala 295	Ile	Leu	Asn	Arg	Ser 300	Glu	Leu	Leu	Asp	
Lys 305	Tyr	Asp	Leu	Ser	Asn 310	Leu	Val	Glu	Ile	Ala 315	Ser	Gly	Gly	Ala	Pro 320	
Leu	Ser	Lys	Glu	Ile 325	Gly	Glu	Ala	Val	Ala 330	Arg	Arg	Phe	Asn	Leu 335	Pro	
Gly	Val	Arg	Gln 340	Gly	Tyr	Gly	Leu	Thr 345	Glu	Thr	Thr	Ser	Ala 350	Ile	Ile	
Ile	Thr 355	Pro	Glu	Gly	Asp	Asp	Lys 360	Pro	Gly	Ala	Ser	Gly 365	Lys	Val	Val	
Pro	Leu 370	Phe	Lys	Ala	Lys	Val 375	Ile	Asp	Leu	Asp	Thr 380	Lys	Lys	Thr	Leu	
Gly 385	Pro	Asn	Arg	Arg	Gly 390	Glu	Val	Cys	Val	Lys 395	Gly	Pro	Met	Leu	Met 400	
Lys	Gly	Tyr	Val 405	Asp	Asn	Pro	Glu	Ala	Thr 410	Arg	Glu	Ile	Ile	Asp 415	Glu	
Glu	Gly	Trp	Leu 420	His	Thr	Gly	Asp	Ile 425	Gly	Tyr	Tyr	Asp	Glu 430	Glu	Lys	
His	Phe	Phe 435	Ile	Val	Asp	Arg	Leu 440	Lys	Ser	Leu	Ile	Lys 445	Tyr	Lys	Gly	

Tyr Gln Val Pro Pro Ala Glu Leu Glu Ser Val Leu Leu Gln His Pro  
 450 455 460

Asn Ile Phe Asp Ala Gly Val Ala Gly Val Pro Asp Pro Ile Ala Gly  
 465 470 475 480

Glu Leu Pro Gly Ala Val Val Val Leu Lys Lys Gly Lys Ser Met Thr  
 485 490 495

Glu Lys Glu Val Met Asp Tyr Val Ala Ser Gln Val Ser Asn Ala Lys  
 500 505 510

Arg Leu Arg Gly Gly Val Arg Phe Val Asp Glu Val Pro Lys Gly Leu  
 515 520 525

Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro  
 530 535 540

Val Ala Lys Met  
 545

<210> 5  
 <211> 1644  
 <212> DNA  
 <213> *Luciola lateralis*

<220>  
 <221> CDS  
 <222> (1)..(1644)

<400> 5  
 atg gaa aac atg gag aac gat gaa aat att gtg tat ggt cct gaa cca 48  
 Met Glu Asn Met Glu Asn Asp Glu Asn Ile Val Tyr Gly Pro Glu Pro  
 1 5 10 15  
 ttt tac cct att gaa gag gga tct gct gga gca caa ttg cgc aag tat 96  
 Phe Tyr Pro Ile Glu Glu Gly Ser Ala Gly Ala Gln Leu Arg Lys Tyr  
 20 25 30  
 atg gat cga tat gca aaa ctt gga gca att gct ttt act aac gca ctt 144  
 Met Asp Arg Tyr Ala Lys Leu Gly Ala Ile Ala Phe Thr Asn Ala Leu  
 35 40 45  
 acc ggt gtc gat tat acg tac gcc gaa tac tta gaa aaa tca tgc tgt 192

Thr	Gly	Val	Asp	Tyr	Thr	Tyr	Ala	Glu	Tyr	Leu	Glu	Lys	Ser	Cys	Cys	
50						55					60					
cta	gga	gag	gct	tta	aag	aat	tat	ggg	ttg	gtt	gtt	gat	gga	aga	att	240
Leu	Gly	Glu	Ala	Leu	Lys	Asn	Tyr	Gly	Leu	Val	Val	Asp	Gly	Arg	Ile	
65					70				75						80	
gcg	tta	tgc	agt	gaa	aac	tgt	gaa	gaa	ttc	ttt	att	cct	gta	tta	gcc	288
Ala	Leu	Cys	Ser	Glu	Asn	Cys	Glu	Glu	Phe	Phe	Ile	Pro	Val	Leu	Ala	
				85					90					95		
ggg	tta	ttt	ata	ggg	gtc	ggg	gtg	gct	cca	act	aat	gag	att	tac	act	336
Gly	Leu	Phe	Ile	Gly	Val	Gly	Val	Ala	Pro	Thr	Asn	Glu	Ile	Tyr	Thr	
			100					105					110			
cta	cgt	gaa	ttg	gtt	cac	agt	tta	ggc	atc	tct	aag	cca	aca	att	gta	384
Leu	Arg	Glu	Leu	Val	His	Ser	Leu	Gly	Ile	Ser	Lys	Pro	Thr	Ile	Val	
		115					120					125				
ttt	agt	tct	aaa	aaa	gga	tta	gat	aaa	gtt	ata	act	gta	caa	aaa	acg	432
Phe	Ser	Ser	Lys	Lys	Gly	Leu	Asp	Lys	Val	Ile	Thr	Val	Gln	Lys	Thr	
	130					135					140					
gta	act	gct	att	aaa	acc	att	gtt	ata	ttg	gac	agc	aaa	gtg	gat	tat	480
Val	Thr	Ala	Ile	Lys	Thr	Ile	Val	Ile	Leu	Asp	Ser	Lys	Val	Asp	Tyr	
145					150					155					160	
aga	ggg	tat	caa	tcc	atg	gac	aac	ttt	att	aaa	aaa	aac	act	cca	caa	528
Arg	Gly	Tyr	Gln	Ser	Met	Asp	Asn	Phe	Ile	Lys	Lys	Asn	Thr	Pro	Gln	
				165					170					175		
ggg	ttc	aaa	gga	tca	agt	ttt	aaa	act	gta	gaa	gtt	aac	cgc	aaa	gaa	576
Gly	Phe	Lys	Gly	Ser	Ser	Phe	Lys	Thr	Val	Glu	Val	Asn	Arg	Lys	Glu	
			180					185					190			
caa	gtt	gct	ctt	ata	atg	aac	tct	tcg	ggg	tca	acc	ggg	ttg	cca	aaa	624
Gln	Val	Ala	Leu	Ile	Met	Asn	Ser	Ser	Gly	Ser	Thr	Gly	Leu	Pro	Lys	
		195					200					205				
ggg	gtg	caa	ctt	act	cat	gaa	aat	atc	gtc	act	aga	ttt	tct	cac	gct	672
Gly	Val	Gln	Leu	Thr	His	Glu	Asn	Ile	Val	Thr	Arg	Phe	Ser	His	Ala	
	210					215					220					
aga	gat	cca	att	tat	gga	aac	caa	gtt	tca	cca	ggc	acg	gct	att	tta	720
Arg	Asp	Pro	Ile	Tyr	Gly	Asn	Gln	Val	Ser	Pro	Gly	Thr	Ala	Ile	Leu	
225					230					235					240	
act	gta	gta	cca	ttc	cat	cat	ggg	ttt	ggg	atg	ttt	act	act	tta	ggc	768
Thr	Val	Val	Pro	Phe	His	His	Gly	Phe	Gly	Met	Phe	Thr	Thr	Leu	Gly	
				245					250					255		
tat	cta	act	tgt	ggg	ttt	cgt	att	gtc	atg	tta	acg	aaa	ttt	gac	gaa	816



Tyr	Leu	Thr	Cys 260	Gly	Phe	Arg	Ile	Val 265	Met	Leu	Thr	Lys	Phe 270	Asp	Glu	
gag	act	ttt	tta	aaa	aca	ctg	caa	gat	tac	aaa	tgt	tca	agc	gtt	att	864
Glu	Thr	Phe 275	Leu	Lys	Thr	Leu	Gln 280	Asp	Tyr	Lys	Cys	Ser 285	Ser	Val	Ile	
ctt	gta	ccg	act	ttg	ttt	gca	att	ctt	aat	aga	agt	gaa	tta	ctc	gat	912
Leu	Val 290	Pro	Thr	Leu	Phe	Ala 295	Ile	Leu	Asn	Arg	Ser 300	Glu	Leu	Leu	Asp	
aaa	tat	gat	tta	tca	aat	tta	gtt	gaa	att	gca	tct	ggc	gga	gca	cct	960
Lys 305	Tyr	Asp	Leu	Ser	Asn 310	Leu	Val	Glu	Ile	Ala 315	Ser	Gly	Gly	Ala	Pro 320	
tta	tct	aaa	gaa	att	ggc	gaa	gct	gtt	gct	aga	cgt	ttt	aat	tta	ccg	1008
Leu	Ser	Lys	Glu	Ile 325	Gly	Glu	Ala	Val	Ala 330	Arg	Arg	Phe	Asn	Leu	Pro 335	
ggc	gtt	cgt	caa	ggc	tat	ggc	tta	aca	gaa	aca	acc	tct	gca	att	att	1056
Gly	Val	Arg 340	Gln	Gly	Tyr	Gly	Leu	Thr 345	Glu	Thr	Thr	Ser	Ala 350	Ile	Ile	
atc	aca	ccg	gaa	ggc	gat	gat	aaa	cca	ggc	gct	tct	ggc	aaa	gtt	gtg	1104
Ile	Thr	Pro 355	Glu	Gly	Asp	Asp	Lys 360	Pro	Gly	Ala	Ser	Gly 365	Lys	Val	Val	
cca	tta	ttt	aaa	gca	aaa	gtt	atc	gat	ctt	gat	act	aaa	aaa	act	ttg	1152
Pro	Leu	Phe 370	Lys	Ala	Lys	Val 375	Ile	Asp	Leu	Asp	Thr 380	Lys	Lys	Thr	Leu	
ggc	ccg	aac	aga	cgt	gga	gaa	gtt	tgt	gta	aag	ggc	cct	atg	ctt	atg	1200
Gly 385	Pro	Asn	Arg	Arg 390	Gly	Glu	Val	Cys	Val	Lys 395	Gly	Pro	Met	Leu	Met 400	
aaa	ggc	tat	gta	gat	aat	cca	gaa	gca	aca	aga	gaa	atc	ata	gat	gaa	1248
Lys	Gly	Tyr	Val 405	Asp	Asn	Pro	Glu	Ala 410	Thr	Arg	Glu	Ile	Ile	Asp 415	Glu	
gaa	ggc	tgg	ttg	cac	aca	gga	gat	att	ggg	tat	tac	gat	gaa	gaa	aaa	1296
Glu	Gly	Trp 420	Leu	His	Thr	Gly	Asp	Ile 425	Gly	Tyr	Tyr	Asp	Glu 430	Glu	Lys	
cat	ttc	ttt	atc	gtg	gat	cgt	ttg	aag	tct	tta	atc	aaa	tac	aaa	gga	1344
His	Phe 435	Phe	Ile	Val	Asp	Arg	Leu 440	Lys	Ser	Leu	Ile	Lys 445	Tyr	Lys	Gly	
tat	caa	gta	cca	cct	gct	gaa	tta	gaa	tct	gtt	ctt	ttg	caa	cat	cca	1392
Tyr	Gln 450	Val	Pro	Pro	Ala 455	Glu	Leu	Glu	Ser	Val 460	Leu	Leu	Gln	His	Pro	
aat	att	ttt	gat	gcc	ggc	gtt	gct	ggc	gtt	cca	gat	cct	ata	gct	ggc	1440

Asn	Ile	Phe	Asp	Ala	Gly	Val	Ala	Gly	Val	Pro	Asp	Pro	Ile	Ala	Gly	
465					470					475					480	
gag	ctt	ccg	gga	gct	gtt	gtt	gta	ctt	aag	aaa	gga	aaa	tct	atg	act	1488
Glu	Leu	Pro	Gly	Ala	Val	Val	Val	Leu	Lys	Lys	Gly	Lys	Ser	Met	Thr	
				485					490					495		
gaa	aaa	gaa	gta	atg	gat	tac	gtt	gct	agt	caa	gtt	tca	aat	gca	aaa	1536
Glu	Lys	Glu	Val	Met	Asp	Tyr	Val	Ala	Ser	Gln	Val	Ser	Asn	Ala	Lys	
			500					505					510			
cgt	ttg	cgt	ggg	ggg	gtc	cgt	ttt	gtg	gac	gaa	gta	cct	aaa	ggg	ctc	1584
Arg	Leu	Arg	Gly	Gly	Val	Arg	Phe	Val	Asp	Glu	Val	Pro	Lys	Gly	Leu	
		515					520					525				
act	ggg	aaa	att	gac	ggg	aaa	gca	att	aga	gaa	ata	ctg	aag	aaa	cca	1632
Thr	Gly	Lys	Ile	Asp	Gly	Lys	Ala	Ile	Arg	Glu	Ile	Leu	Lys	Lys	Pro	
	530					535					540					
gtt	gct	aag	atg													1644
Val	Ala	Lys	Met													
545																

<210> 6  
 <211> 548  
 <212> PRT  
 <213> *Luciola lateralis*

<400> 6

Met	Glu	Asn	Met	Glu	Asn	Asp	Glu	Asn	Ile	Val	Tyr	Gly	Pro	Glu	Pro	
1				5					10					15		
Phe	Tyr	Pro	Ile	Glu	Glu	Gly	Ser	Ala	Gly	Ala	Gln	Leu	Arg	Lys	Tyr	
			20					25					30			
Met	Asp	Arg	Tyr	Ala	Lys	Leu	Gly	Ala	Ile	Ala	Phe	Thr	Asn	Ala	Leu	
		35					40					45				
Thr	Gly	Val	Asp	Tyr	Thr	Tyr	Ala	Glu	Tyr	Leu	Glu	Lys	Ser	Cys	Cys	
	50					55					60					
Leu	Gly	Glu	Ala	Leu	Lys	Asn	Tyr	Gly	Leu	Val	Val	Asp	Gly	Arg	Ile	
65					70					75					80	
Ala	Leu	Cys	Ser	Glu	Asn	Cys	Glu	Glu	Phe	Phe	Ile	Pro	Val	Leu	Ala	

85

90

95

Gly Leu Phe Ile Gly Val Gly Val Ala Pro Thr Asn Glu Ile Tyr Thr  
 100 105 110

Leu Arg Glu Leu Val His Ser Leu Gly Ile Ser Lys Pro Thr Ile Val  
 115 120 125

Phe Ser Ser Lys Lys Gly Leu Asp Lys Val Ile Thr Val Gln Lys Thr  
 130 135 140

Val Thr Ala Ile Lys Thr Ile Val Ile Leu Asp Ser Lys Val Asp Tyr  
 145 150 155 160

Arg Gly Tyr Gln Ser Met Asp Asn Phe Ile Lys Lys Asn Thr Pro Gln  
 165 170 175

Gly Phe Lys Gly Ser Ser Phe Lys Thr Val Glu Val Asn Arg Lys Glu  
 180 185 190

Gln Val Ala Leu Ile Met Asn Ser Ser Gly Ser Thr Gly Leu Pro Lys  
 195 200 205

Gly Val Gln Leu Thr His Glu Asn Ile Val Thr Arg Phe Ser His Ala  
 210 215 220

Arg Asp Pro Ile Tyr Gly Asn Gln Val Ser Pro Gly Thr Ala Ile Leu  
 225 230 235 240

Thr Val Val Pro Phe His His Gly Phe Gly Met Phe Thr Thr Leu Gly  
 245 250 255

Tyr Leu Thr Cys Gly Phe Arg Ile Val Met Leu Thr Lys Phe Asp Glu  
 260 265 270

Glu Thr Phe Leu Lys Thr Leu Gln Asp Tyr Lys Cys Ser Ser Val Ile  
 275 280 285

Leu Val Pro Thr Leu Phe Ala Ile Leu Asn Arg Ser Glu Leu Leu Asp

290					295					300					
Lys	Tyr	Asp	Leu	Ser	Asn	Leu	Val	Glu	Ile	Ala	Ser	Gly	Gly	Ala	Pro
305					310					315					320
Leu	Ser	Lys	Glu	Ile	Gly	Glu	Ala	Val	Ala	Arg	Arg	Phe	Asn	Leu	Pro
				325					330					335	
Gly	Val	Arg	Gln	Gly	Tyr	Gly	Leu	Thr	Glu	Thr	Thr	Ser	Ala	Ile	Ile
			340					345					350		
Ile	Thr	Pro	Glu	Gly	Asp	Asp	Lys	Pro	Gly	Ala	Ser	Gly	Lys	Val	Val
		355					360					365			
Pro	Leu	Phe	Lys	Ala	Lys	Val	Ile	Asp	Leu	Asp	Thr	Lys	Lys	Thr	Leu
	370					375					380				
Gly	Pro	Asn	Arg	Arg	Gly	Glu	Val	Cys	Val	Lys	Gly	Pro	Met	Leu	Met
385					390					395					400
Lys	Gly	Tyr	Val	Asp	Asn	Pro	Glu	Ala	Thr	Arg	Glu	Ile	Ile	Asp	Glu
				405					410					415	
Glu	Gly	Trp	Leu	His	Thr	Gly	Asp	Ile	Gly	Tyr	Tyr	Asp	Glu	Glu	Lys
			420					425					430		
His	Phe	Phe	Ile	Val	Asp	Arg	Leu	Lys	Ser	Leu	Ile	Lys	Tyr	Lys	Gly
		435					440					445			
Tyr	Gln	Val	Pro	Pro	Ala	Glu	Leu	Glu	Ser	Val	Leu	Leu	Gln	His	Pro
	450					455					460				
Asn	Ile	Phe	Asp	Ala	Gly	Val	Ala	Gly	Val	Pro	Asp	Pro	Ile	Ala	Gly
465					470					475					480
Glu	Leu	Pro	Gly	Ala	Val	Val	Val	Leu	Lys	Lys	Gly	Lys	Ser	Met	Thr
				485					490					495	
Glu	Lys	Glu	Val	Met	Asp	Tyr	Val	Ala	Ser	Gln	Val	Ser	Asn	Ala	Lys

500	505	510	
Arg Leu Arg Gly Gly Val Arg Phe Val Asp Glu Val Pro Lys Gly Leu			
515	520	525	
Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro			
530	535	540	
Val Ala Lys Met			
545			
<210>	7		
<211>	1644		
<212>	DNA		
<213>	Luciola lateralis		
<220>			
<221>	CDS		
<222>	(1) .. (1644)		
<400>	7		
atg gaa aac atg gag aac gat gaa aat att gtg tat ggt cct gaa cca			48
Met Glu Asn Met Glu Asn Asp Glu Asn Ile Val Tyr Gly Pro Glu Pro			
1	5	10	15
ttt tac cct att gaa gag gga tct gct gga gca caa ttg cgc aag tat			96
Phe Tyr Pro Ile Glu Glu Gly Ser Ala Gly Ala Gln Leu Arg Lys Tyr			
	20	25	30
atg gat cga tat gca aaa ctt gga gca att gct ttt act aac gca ctt			144
Met Asp Arg Tyr Ala Lys Leu Gly Ala Ile Ala Phe Thr Asn Ala Leu			
	35	40	45
acc ggt gtc gat tat acg tac gcc gaa tac tta gaa aaa tca tgc tgt			192
Thr Gly Val Asp Tyr Thr Tyr Ala Glu Tyr Leu Glu Lys Ser Cys Cys			
	50	55	60
cta gga gag gct tta aag aat tat ggt ttg gtt gtt gat gga aga att			240
Leu Gly Glu Ala Leu Lys Asn Tyr Gly Leu Val Val Asp Gly Arg Ile			
65	70	75	80
gcg tta tgc agt gaa aac tgt gaa gaa ttc ttt att cct gta tta gcc			288
Ala Leu Cys Ser Glu Asn Cys Glu Glu Phe Phe Ile Pro Val Leu Ala			
	85	90	95
ggt tta ttt ata ggt gtc ggt gtg gct cca act aat gag att tac act			336
Gly Leu Phe Ile Gly Val Gly Val Ala Pro Thr Asn Glu Ile Tyr Thr			

100						105						110						
cta	cgt	gaa	ttg	gtt	cac	agt	tta	ggc	atc	tct	aag	cca	aca	att	gta	384		
Leu	Arg	Glu	Leu	Val	His	Ser	Leu	Gly	Ile	Ser	Lys	Pro	Thr	Ile	Val			
		115						120					125					
ttt	agt	tct	aaa	aaa	gga	tta	gat	aaa	gtt	ata	act	gta	caa	aaa	acg	432		
Phe	Ser	Ser	Lys	Lys	Gly	Leu	Asp	Lys	Val	Ile	Thr	Val	Gln	Lys	Thr			
		130					135				140							
gta	act	gct	att	aaa	acc	att	gtt	ata	ttg	gac	agc	aaa	gtg	gat	tat	480		
Val	Thr	Ala	Ile	Lys	Thr	Ile	Val	Ile	Leu	Asp	Ser	Lys	Val	Asp	Tyr			
		145			150					155					160			
aga	ggc	tat	caa	tcc	atg	gac	aac	ttt	att	aaa	aaa	aac	act	cca	caa	528		
Arg	Gly	Tyr	Gln	Ser	Met	Asp	Asn	Phe	Ile	Lys	Lys	Asn	Thr	Pro	Gln			
				165					170					175				
ggc	ttc	aaa	gga	tca	agt	ttt	aaa	act	gta	gaa	gtt	aac	cgc	aaa	gaa	576		
Gly	Phe	Lys	Gly	Ser	Ser	Phe	Lys	Thr	Val	Glu	Val	Asn	Arg	Lys	Glu			
			180					185					190					
caa	gtt	gct	ctt	ata	atg	aac	tct	tcg	ggc	tca	acc	ggc	ttg	cca	aaa	624		
Gln	Val	Ala	Leu	Ile	Met	Asn	Ser	Ser	Gly	Ser	Thr	Gly	Leu	Pro	Lys			
		195					200					205						
ggc	gtg	caa	ctt	act	cat	gaa	aat	gca	gtc	act	aga	ttt	tct	cac	gct	672		
Gly	Val	Gln	Leu	Thr	His	Glu	Asn	Ala	Val	Thr	Arg	Phe	Ser	His	Ala			
		210				215					220							
aga	gat	cca	att	tat	gga	aac	caa	gtt	tca	cca	ggc	acg	gct	att	tta	720		
Arg	Asp	Pro	Ile	Tyr	Gly	Asn	Gln	Val	Ser	Pro	Gly	Thr	Ala	Ile	Leu			
		225			230					235					240			
act	gta	gta	cca	ttc	cat	cat	ggc	ttt	ggc	atg	ttt	act	act	tta	ggc	768		
Thr	Val	Val	Pro	Phe	His	His	Gly	Phe	Gly	Met	Phe	Thr	Thr	Leu	Gly			
				245					250					255				
tat	cta	act	tgt	ggc	ttt	cgt	att	gtc	atg	tta	acg	aaa	ttt	gac	gaa	816		
Tyr	Leu	Thr	Cys	Gly	Phe	Arg	Ile	Val	Met	Leu	Thr	Lys	Phe	Asp	Glu			
			260					265					270					
gag	act	ttt	tta	aaa	aca	ctg	caa	gat	tac	aaa	tgt	tca	agc	gtt	att	864		
Glu	Thr	Phe	Leu	Lys	Thr	Leu	Gln	Asp	Tyr	Lys	Cys	Ser	Ser	Val	Ile			
		275					280					285						
ctt	gta	ccg	act	ttg	ttt	gca	att	ctt	aat	aga	agt	gaa	tta	ctc	gat	912		
Leu	Val	Pro	Thr	Leu	Phe	Ala	Ile	Leu	Asn	Arg	Ser	Glu	Leu	Leu	Asp			
		290				295					300							
aaa	tat	gat	tta	tca	aat	tta	gtt	gaa	att	gca	tct	ggc	gga	gca	cct	960		
Lys	Tyr	Asp	Leu	Ser	Asn	Leu	Val	Glu	Ile	Ala	Ser	Gly	Gly	Ala	Pro			

305		310		315		320	
tta tct aaa gaa att ggt gaa gct gtt gct aga cgt ttt aat tta ccg	1008						
Leu Ser Lys Glu Ile Gly Glu Ala Val Ala Arg Arg Phe Asn Leu Pro							
		325		330		335	
ggg ggt cgt caa ggc tat ggt tta aca gaa aca acc tct gca att att	1056						
Gly Val Arg Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Ile Ile							
		340		345		350	
atc aca ccg gaa ggc gat gat aaa cca ggt gct tct ggc aaa gtt gtg	1104						
Ile Thr Pro Glu Gly Asp Asp Lys Pro Gly Ala Ser Gly Lys Val Val							
		355		360		365	
cca tta ttt aaa gca aaa gtt atc gat ctt gat act aaa aaa act ttg	1152						
Pro Leu Phe Lys Ala Lys Val Ile Asp Leu Asp Thr Lys Lys Thr Leu							
		370		375		380	
ggc ccg aac aga cgt gga gaa gtt tgt gta aag ggt cct atg ctt atg	1200						
Gly Pro Asn Arg Arg Gly Glu Val Cys Val Lys Gly Pro Met Leu Met							
		385		390		395	400
aaa ggt tat gta gat aat cca gaa gca aca aga gaa atc ata gat gaa	1248						
Lys Gly Tyr Val Asp Asn Pro Glu Ala Thr Arg Glu Ile Ile Asp Glu							
		405		410		415	
gaa ggt tgg ttg cac aca gga gat att ggg tat tac gat gaa gaa aaa	1296						
Glu Gly Trp Leu His Thr Gly Asp Ile Gly Tyr Tyr Asp Glu Glu Lys							
		420		425		430	
cat ttc ttt atc gtg gat cgt ttg aag tct tta atc aaa tac aaa gga	1344						
His Phe Phe Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly							
		435		440		445	
tat caa gta cca cct gct gaa tta gaa tct gtt ctt ttg caa cat cca	1392						
Tyr Gln Val Pro Pro Ala Glu Leu Glu Ser Val Leu Leu Gln His Pro							
		450		455		460	
aat att ttt gat gcc ggc gtt gct ggc gtt cca gat cct ata gct ggt	1440						
Asn Ile Phe Asp Ala Gly Val Ala Gly Val Pro Asp Pro Ile Ala Gly							
		465		470		475	480
gag ctt ccg gga gct gtt gtt gta ctt gaa aaa gga aaa tct atg act	1488						
Glu Leu Pro Gly Ala Val Val Val Leu Glu Lys Gly Lys Ser Met Thr							
		485		490		495	
gaa aaa gaa gta atg gat tac gtt gct agt caa gtt tca aat gca aaa	1536						
Glu Lys Glu Val Met Asp Tyr Val Ala Ser Gln Val Ser Asn Ala Lys							
		500		505		510	
cgt ttg cgt ggt ggt gtc cgt ttt gtg gac gaa gta cct aaa ggt ctc	1584						
Arg Leu Arg Gly Gly Val Arg Phe Val Asp Glu Val Pro Lys Gly Leu							

515	520	525	
act ggt aaa att gac ggt aaa gca att aga gaa ata ctg aag aaa cca			1632
Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro			
530	535	540	
ggt gct aag atg			1644
Val Ala Lys Met			
545			
<210> 8			
<211> 548			
<212> PRT			
<213> <i>Luciola lateralis</i>			
<400> 8			
Met Glu Asn Met Glu Asn Asp Glu Asn Ile Val Tyr Gly Pro Glu Pro			
1	5	10	15
Phe Tyr Pro Ile Glu Glu Gly Ser Ala Gly Ala Gln Leu Arg Lys Tyr			
	20	25	30
Met Asp Arg Tyr Ala Lys Leu Gly Ala Ile Ala Phe Thr Asn Ala Leu			
	35	40	45
Thr Gly Val Asp Tyr Thr Tyr Ala Glu Tyr Leu Glu Lys Ser Cys Cys			
50	55	60	
Leu Gly Glu Ala Leu Lys Asn Tyr Gly Leu Val Val Asp Gly Arg Ile			
65	70	75	80
Ala Leu Cys Ser Glu Asn Cys Glu Glu Phe Phe Ile Pro Val Leu Ala			
	85	90	95
Gly Leu Phe Ile Gly Val Gly Val Ala Pro Thr Asn Glu Ile Tyr Thr			
	100	105	110
Leu Arg Glu Leu Val His Ser Leu Gly Ile Ser Lys Pro Thr Ile Val			
	115	120	125
Phe Ser Ser Lys Lys Gly Leu Asp Lys Val Ile Thr Val Gln Lys Thr			
130	135	140	



Val	Thr	Ala	Ile	Lys	Thr	Ile	Val	Ile	Leu	Asp	Ser	Lys	Val	Asp	Tyr	145	150	155	160
Arg	Gly	Tyr	Gln	Ser	Met	Asp	Asn	Phe	Ile	Lys	Lys	Asn	Thr	Pro	Gln	165	170	175	
Gly	Phe	Lys	Gly	Ser	Ser	Phe	Lys	Thr	Val	Glu	Val	Asn	Arg	Lys	Glu	180	185	190	
Gln	Val	Ala	Leu	Ile	Met	Asn	Ser	Ser	Gly	Ser	Thr	Gly	Leu	Pro	Lys	195	200	205	
Gly	Val	Gln	Leu	Thr	His	Glu	Asn	Ala	Val	Thr	Arg	Phe	Ser	His	Ala	210	215	220	
Arg	Asp	Pro	Ile	Tyr	Gly	Asn	Gln	Val	Ser	Pro	Gly	Thr	Ala	Ile	Leu	225	230	235	240
Thr	Val	Val	Pro	Phe	His	His	Gly	Phe	Gly	Met	Phe	Thr	Thr	Leu	Gly	245	250	255	
Tyr	Leu	Thr	Cys	Gly	Phe	Arg	Ile	Val	Met	Leu	Thr	Lys	Phe	Asp	Glu	260	265	270	
Glu	Thr	Phe	Leu	Lys	Thr	Leu	Gln	Asp	Tyr	Lys	Cys	Ser	Ser	Val	Ile	275	280	285	
Leu	Val	Pro	Thr	Leu	Phe	Ala	Ile	Leu	Asn	Arg	Ser	Glu	Leu	Leu	Asp	290	295	300	
Lys	Tyr	Asp	Leu	Ser	Asn	Leu	Val	Glu	Ile	Ala	Ser	Gly	Gly	Ala	Pro	305	310	315	320
Leu	Ser	Lys	Glu	Ile	Gly	Glu	Ala	Val	Ala	Arg	Arg	Phe	Asn	Leu	Pro	325	330	335	
Gly	Val	Arg	Gln	Gly	Tyr	Gly	Leu	Thr	Glu	Thr	Thr	Ser	Ala	Ile	Ile	340	345	350	

Ile	Thr	Pro	Glu	Gly	Asp	Asp	Lys	Pro	Gly	Ala	Ser	Gly	Lys	Val	Val	355	360	365	
Pro	Leu	Phe	Lys	Ala	Lys	Val	Ile	Asp	Leu	Asp	Thr	Lys	Lys	Thr	Leu	370	375	380	
Gly	Pro	Asn	Arg	Arg	Gly	Glu	Val	Cys	Val	Lys	Gly	Pro	Met	Leu	Met	385	390	395	400
Lys	Gly	Tyr	Val	Asp	Asn	Pro	Glu	Ala	Thr	Arg	Glu	Ile	Ile	Asp	Glu	405	410	415	
Glu	Gly	Trp	Leu	His	Thr	Gly	Asp	Ile	Gly	Tyr	Tyr	Asp	Glu	Glu	Lys	420	425	430	
His	Phe	Phe	Ile	Val	Asp	Arg	Leu	Lys	Ser	Leu	Ile	Lys	Tyr	Lys	Gly	435	440	445	
Tyr	Gln	Val	Pro	Pro	Ala	Glu	Leu	Glu	Ser	Val	Leu	Leu	Gln	His	Pro	450	455	460	
Asn	Ile	Phe	Asp	Ala	Gly	Val	Ala	Gly	Val	Pro	Asp	Pro	Ile	Ala	Gly	465	470	475	480
Glu	Leu	Pro	Gly	Ala	Val	Val	Val	Leu	Glu	Lys	Gly	Lys	Ser	Met	Thr	485	490	495	
Glu	Lys	Glu	Val	Met	Asp	Tyr	Val	Ala	Ser	Gln	Val	Ser	Asn	Ala	Lys	500	505	510	
Arg	Leu	Arg	Gly	Gly	Val	Arg	Phe	Val	Asp	Glu	Val	Pro	Lys	Gly	Leu	515	520	525	
Thr	Gly	Lys	Ile	Asp	Gly	Lys	Ala	Ile	Arg	Glu	Ile	Leu	Lys	Lys	Pro	530	535	540	
Val	Ala	Lys	Met													545			